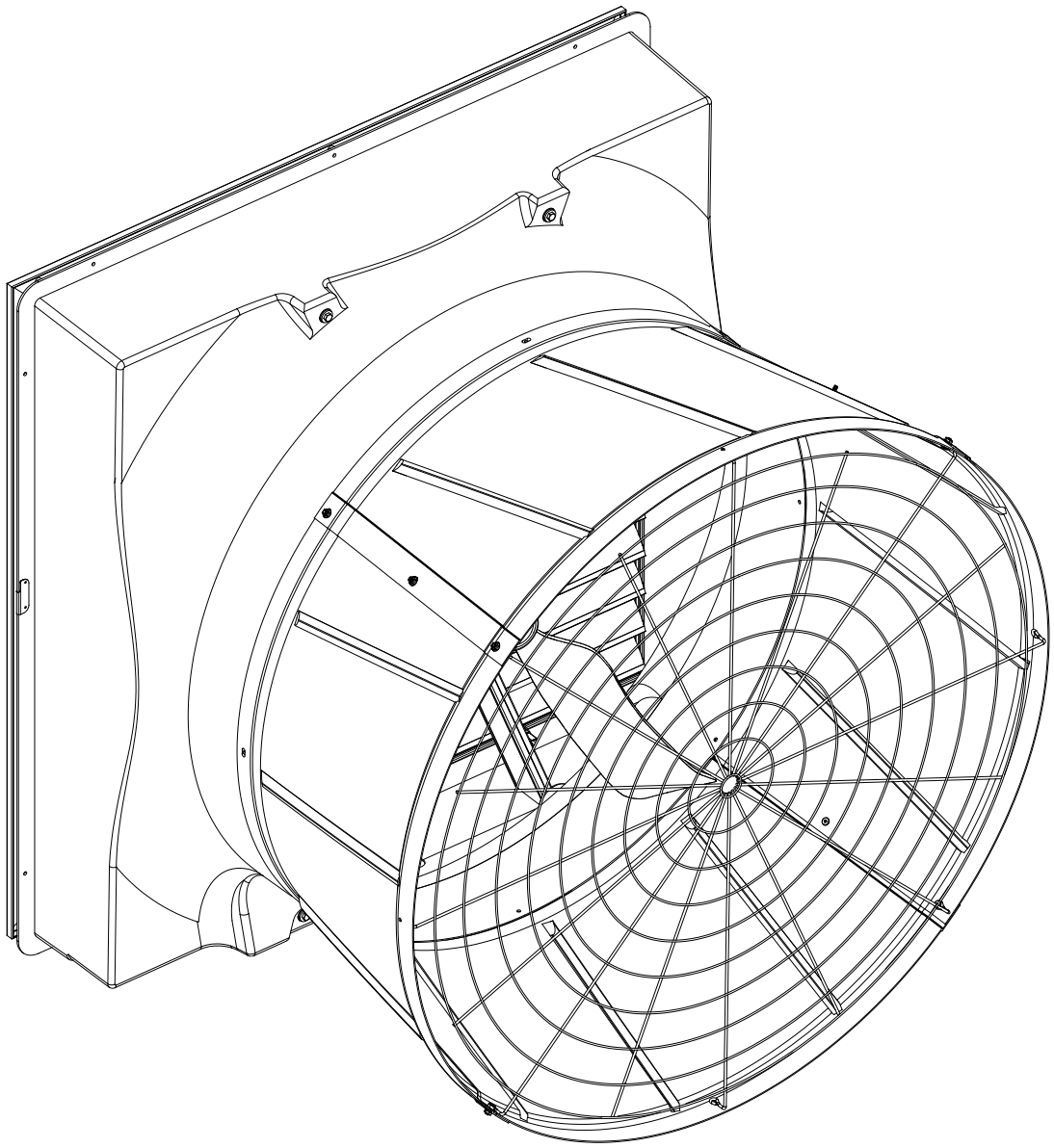
51" and 55" Vortex® Fans
with FC Cone

VX511FCx-FC • VX5115FCx-FC • VX512FCx-FC • VX551FCx-FC • VX5515FCx -FC • VX552FCx-FC

Protected by U.S. Patent No. 6,386,828, 6616404; 6953320



Munters Corporation
4215 Legion Dr. Mason, MI 48854-1036 USA
(517) 676-7070 Fax (517) 676-7078 www.munters.us

FORM: QM1063
Rev. 9, January 2013

TABLE OF CONTENTS

Section	Page
Parts List	3
Fan Dimentions	4
Installation Instruction	5-11
Electrical Wiring	11-12
Operation	13
Maintenance	13-14
Trouble Shooting	15
Winterizing Fan	15
Winter Weather Protection	16
Exploded View and Parts List	17-18

THANK YOU

Thank you for purchasing an Aerotech Vortex Fan from Munters. Munters equipment is designed to be the highest performing, highest quality equipment you can buy. With the proper installation and maintenance it will provide many years of service.

PLEASE NOTE

To achieve maximum performance and insure long life from your Munters product it is essential that it be ***installed and maintained properly.*** Please read all instructions carefully before beginning installation.

WARRANTY

For Warranty claims information see the "Warranty Claims and Return Policy" form QM1021 available from the Aerotech Ventilation System, Munters Corporation office at 1-800-227-2376 or by e-mail at aerotech@munters.com.

Conditions and Limitations:

- Products and Systems involved in a warranty claim under the "Warranty Claims and Return Policy" shall have been properly installed, maintained and operated under competent supervision, according to the instructions provided by Aerotech Ventilation Systems, Munters Corporation.
- Malfunction or failure resulting from misuse, abuse, negligence, alteration, accident or lack of proper installation or maintenance shall not be considered a defect under the Warranty.

UNPACKING THE EQUIPMENT

Before beginning installation, check the overall condition of the equipment. Remove packing materials, and examine all components for signs of shipping damage. Any shipping damage is the customer's responsibility and should be reported immediately to your freight carrier. Fan is shipped complete with all accessories. Remove shutter, guard and cone sections before proceeding with installation.

Each Fan includes:

1 – Belt Drive Fan
4 – Cone sections (all the same)
1 – Shutter
1 – Hardware Package as follows:

HP1096 – 51" Standard Cone, PT/PV Shutter

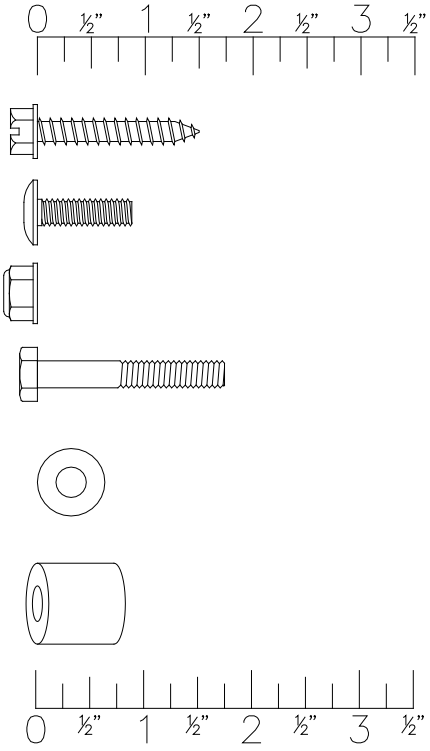
[A]…..12 – #14 x 1.5" Lag Screw, SS
[B]…..20 – ¼"-20 x ⅞" Truss Head Bolt, S.S
[C]…..20 – ¼"-20 Hex Flange, Nylock Nut, S.S.

HP1127 – 51" Extended Depth Cone, PT/PV Shutter

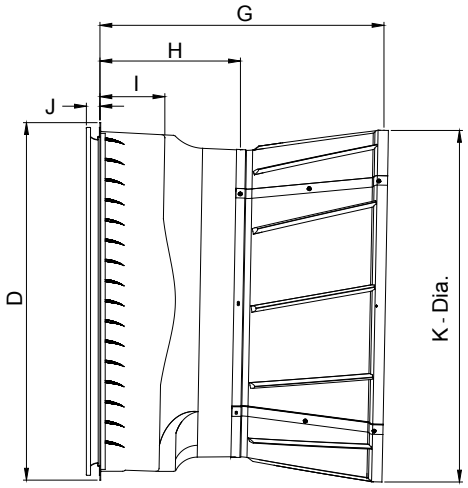
[A]…..12 – #14 x 1.5" Lag Screw, SS
[B]…..16 – ¼"-20 x ⅞" Truss Head Bolt, S.S
[C]…..24 – ¼"-20 Hex Flange, Nylock Nut, S.S.
[E]…..8 – ¼" x 1¾" Hex Bolt. SS
[F]…..8 – ¼" Flat Washer, SS
[G]…..8 – ¾" O.D. x ¾"L. Spacer

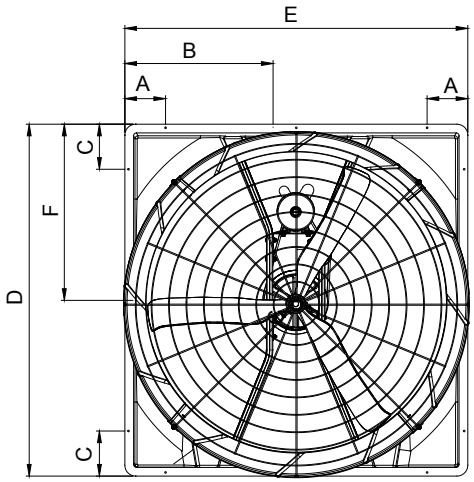
HP1094 – 55" Standard Cone, PT/PV Shutter

[A]…..12 – #14 x 1.5" Lag Screw, SS
[B]…..24 – ¼"-20 x ⅞" Truss Head Bolt, S.S
[C]…..24 – ¼"-20 Hex Flange, Nylock Nut, S.S.



FAN DIMENSIONS





Fan Specifications:

Hertz:	60		60
Voltage:	120/240VAC	or	208-240/480VAC
Phase:	1	or	3
Hertz:	50		50
Voltage:	110/208-220VAC	or	190/380VAC
Phase:	1	or	3

FAN DIA.	A	B	C	D	E	F	G	H	I	J	K - Dia.	WALL OPENING (I.D., framed)
51FCE	7"	29 1/2"	7 3/4"	60 1/2"	59"	30 5/16"	59 15/16"	23 3/16"	11"	2 5/16"	63 1/8"	56 1/4"W. x 57 3/4"H.
51"	7"	29 1/2"	7 3/4"	60 1/2"	59"	30 5/16"	48 1/16"	23 3/16"	11"	2 5/16"	59 1/2"	56 1/4"W. x 57 3/4"H.
55"	7 3/8"	31 3/8"	7 13/16"	63 5/8"	62 3/4"	32 7/8"	50 1/4"	25 15/16"	11 3/4"	2 5/16"	63 3/4"	60"W. x 61 1/4"H.

INSTALLATION INSTRUCTIONS

Step 1

Construct the framed opening to correct size according to the Chart A. ***See Figure 1A,1B and 1C.***

Fan Dia.	Cone	Wall Opening (W. x H.)	Minimum Spacing 'Z'
51"	51FC	56 1/4"W. x 57 3/4"H.	12" recommended; 3 1/2" minimum
51"	51FCE	56 1/4"W. x 57 3/4"H.	12" recommended; 5 1/2" minimum
55"	55FC	60"W. x 61 1/4"H.	12" recommended; 5 1/2" minimum

Chart A

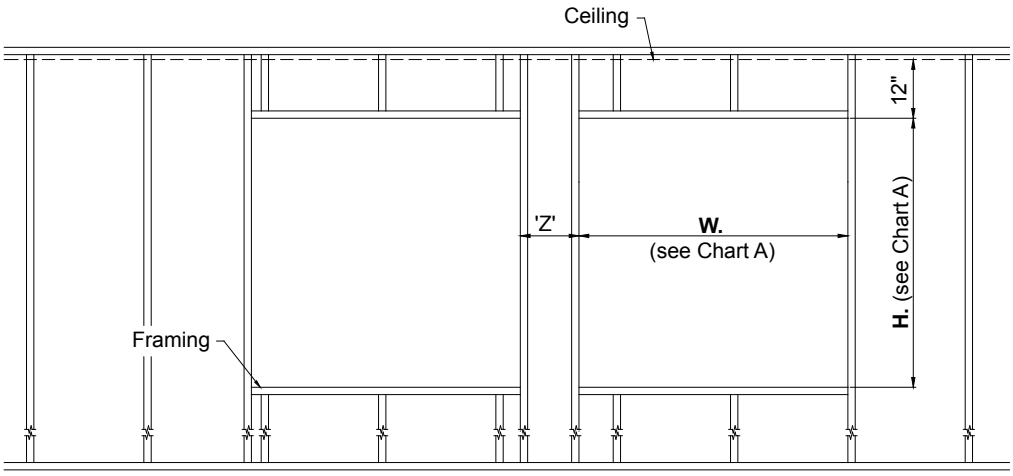


Figure 1A
FRAME CONSTRUCTION

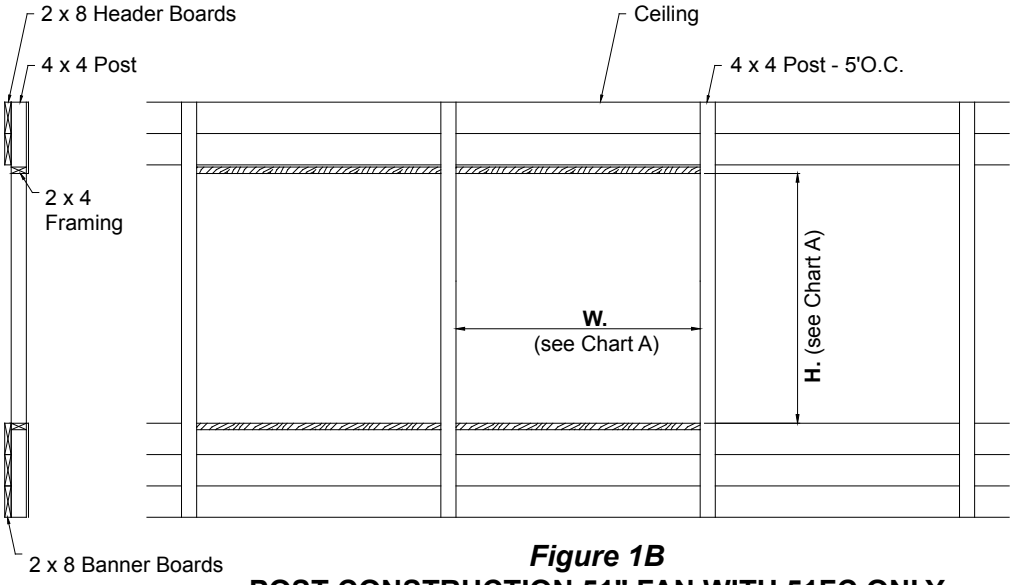


Figure 1B
POST CONSTRUCTION 51" FAN WITH 51FC ONLY

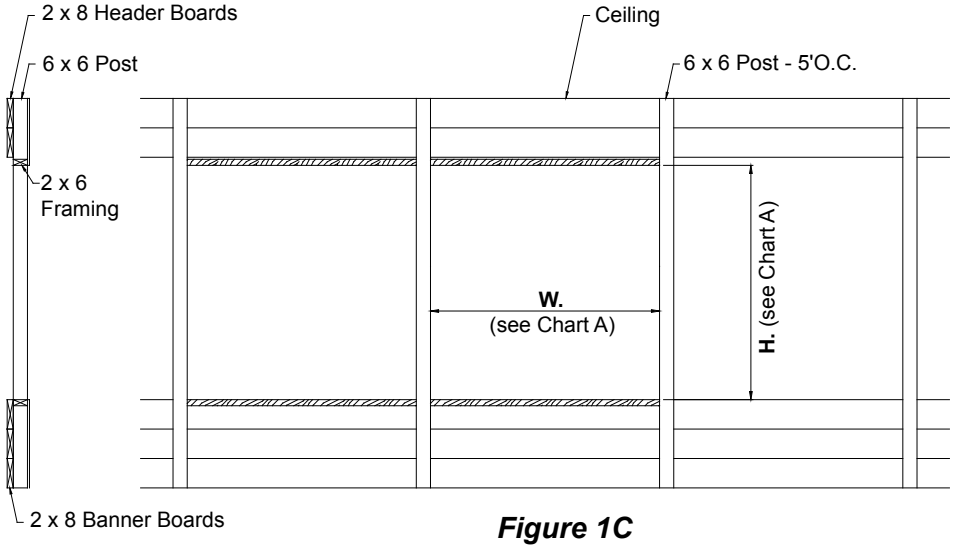


Figure 1C
POST CONSTRUCTION 51" FAN WITH 51FCE OR 55" FAN

Step 2A

Insert fan into the framed opening from the inside. While lifting fan up tight to framing, fasten top of fan with (3) Lag Screw [A]. ***See Figure 2A & 2B.*** Next, fasten bottom of fan, then both sides with remaining (9) Lag Screw [A]. Install flashing around opening tight to fan and caulk around fan to seal.

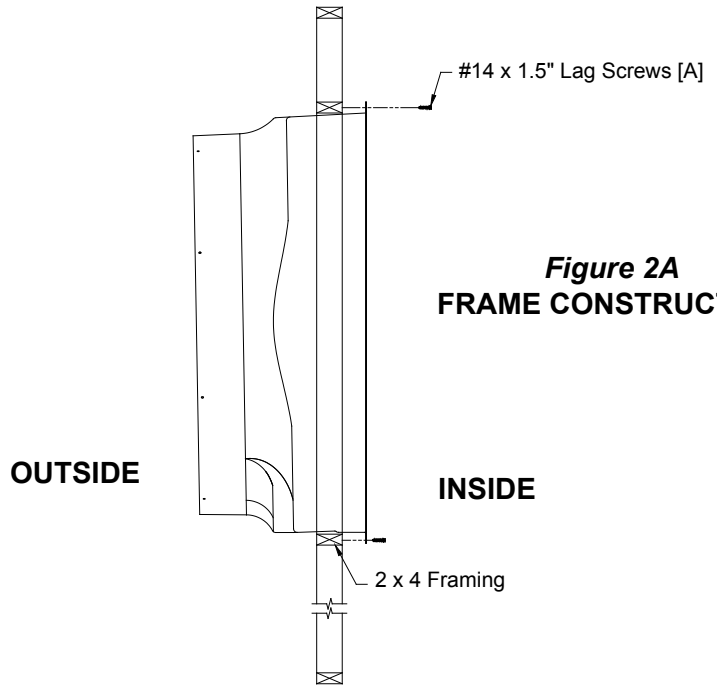


Figure 2A
FRAME CONSTRUCTION

Step 2B

If fan needs to be mounted, so that shutter does not stick into building then frame fan as shown in ***Figure 3***. Top and sides require 4" minimum and bottom requires 2" minimum.

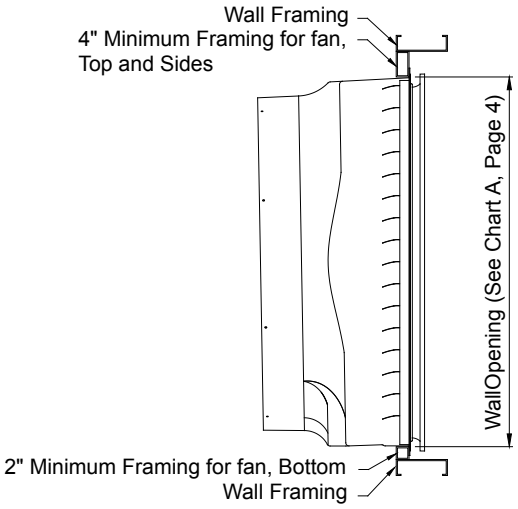


Figure 3

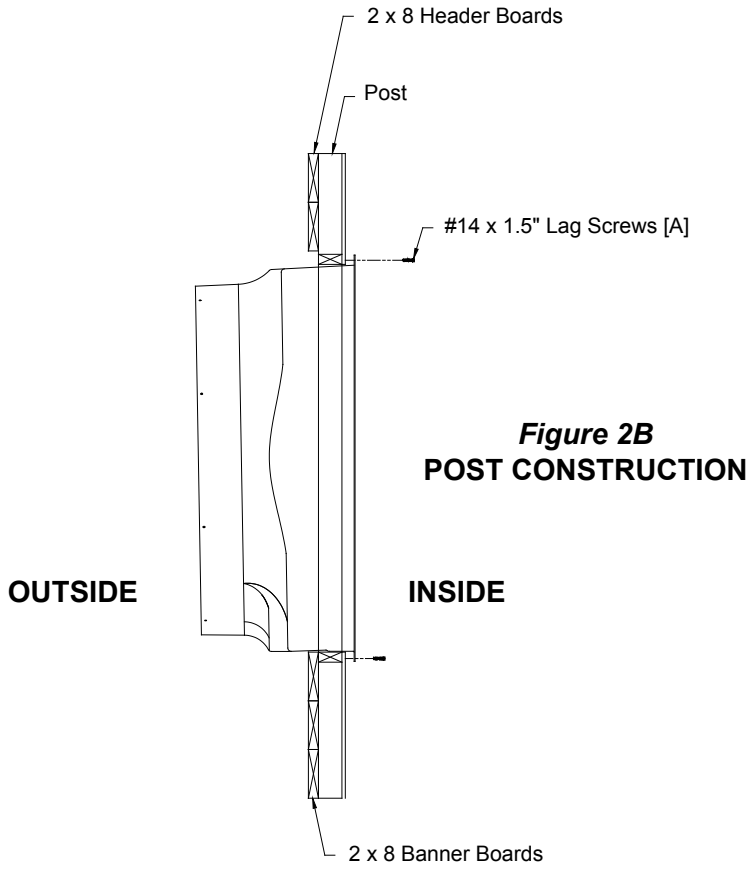


Figure 2B
POST CONSTRUCTION

Step 3

Remove packaging from cone and guard sections.

Step 4

Place (1) cone section on top of fan outlet with the middle of the cone section at the 12 o'clock position, as shown in ***Figure 4.*** Install (2) Truss Head Bolt [B] through hole in fan outlet and left and middle slots in cone section. Secure with Flange Nut [C]. Wafer head of each bolt must be on inside of fan outlet; flange nuts must be on outside of cone. ***See Figure 5.*** Tighten nuts finger tight until cone section fits firmly around fan outlet.

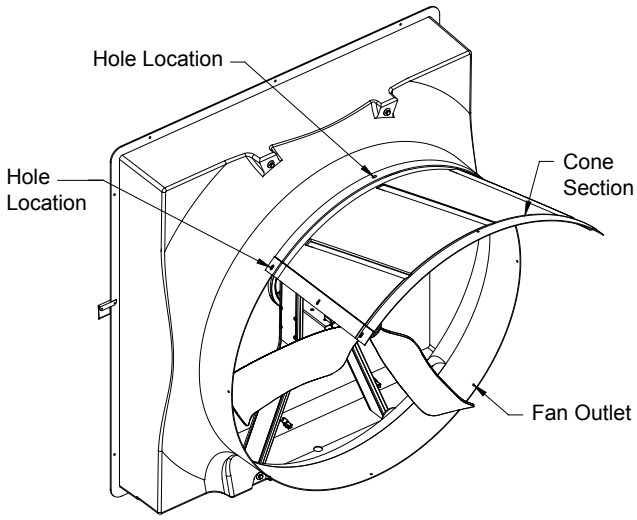


Figure 4

Step 5

Facing fan outlet and working in a clockwise rotation, place right cone section on side of fan outlet, overlapping the first cone section. Attach it to fan outlet using (2) Truss Head Bolt [B] with Flange Nut [C], as done in Step 4. Tighten nuts finger tight at this time.

Step 6

Repeat Step 5 placing bottom and left cone sections around fan outlet. The bolt in the left hole of the first cone section will need to be removed to attach the last cone section.

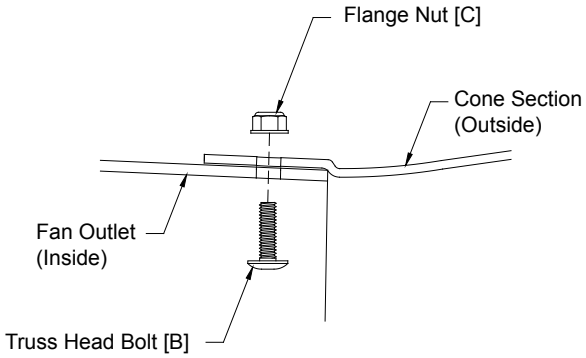


Figure 5

Step 7

Join cone sections together by installing Truss Head Bolt [B] through hole and into slot in the center of each joint. ***See Figure 6A and 6B*****.** Tighten nuts finger tight at this time. **For 51"FCE**, join cone sections together by installing Truss Head Bolt [B] through (2) holes and into slots in the center of each joint.

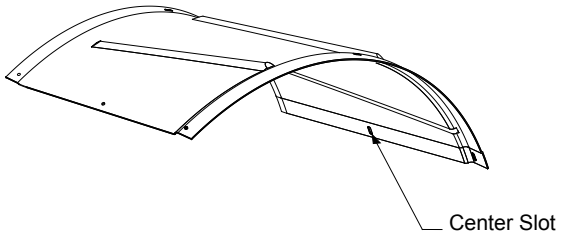


Figure 6A

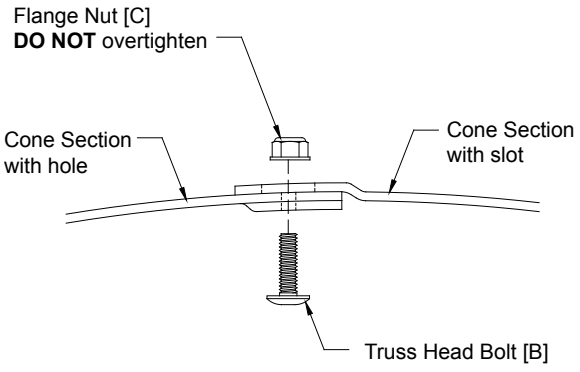


Figure 6B

51FC and 55FC

Step 8A

Insert guard into cone with the guard eyelets facing away from you. Make sure each eyelet lines up with a hole in the cone sections, and secure with (8) Truss Head Bolt [B] & Flange Head [C]. **DO NOT** tighten bolts at this time. ***See Figure 7A and 7B.*** Proceed to step 9.

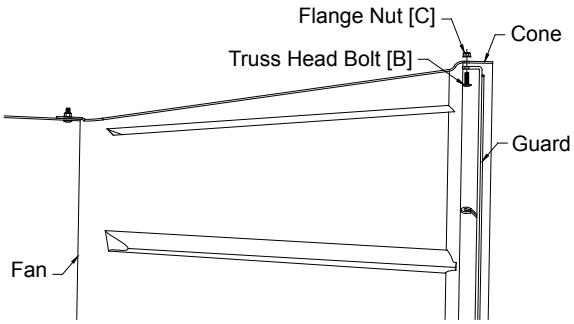


Figure 7A
51FC & 55FC FAN CONE

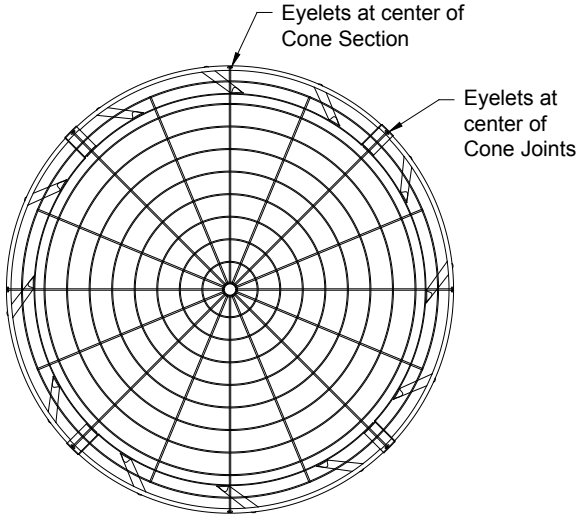


Figure 7B
51FC & 55FC FAN CONE

FOR 51FCE

Step 8B

Insert guard into cone with the guard eyelets facing away from you. Make sure each eyelet lines up with a hole in the cone sections, and secure with (8) Hex Head Bolt [E], Washer [F], Spacer [G] & Flange Nut [C]. **DO NOT** tighten bolts at this time. ***See Figure 8A and 8B.*** Proceed to step 9.

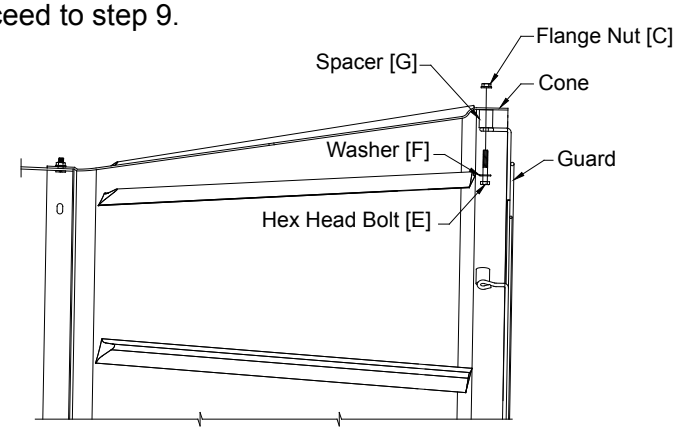


Figure 8A
51FCE CONE

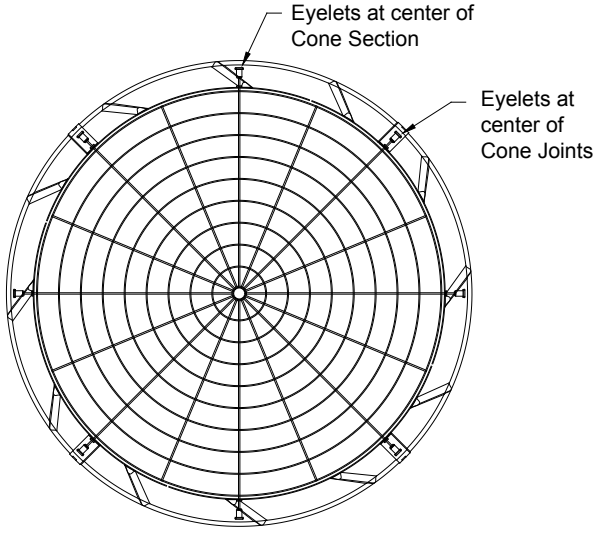


Figure 8B
51FCE CONE

Step 9

Push cone sections together at each joint to tighten cone around guard. Tighten wafer head bolts and nuts at all joints, taking care not to overtighten. Tighten all bolts holding guard in place.

If fan was ordered with 'PT' style shutter, proceed to **Step 10**. *If the 'PV' style shutter was ordered then proceed to* **Step 12**.

PT style shutter

Step 10

Insert PT Shutter into fan by sliding the bottom flange of shutter into bottom shutter clips and pressing shutter inward. ***See Figure 9.***

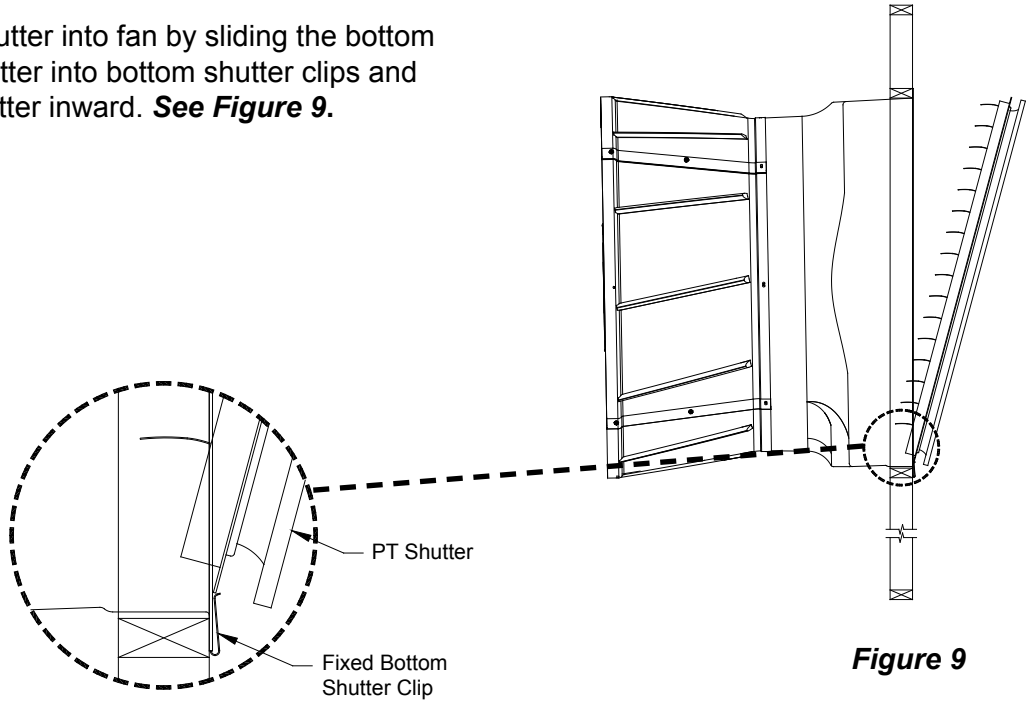


Figure 9

⚠NOTE

PT shutter extends into room 2 5/16" from back of fan.

Step 11

Fasten shutter in place by rotating the side and top shutter clips over the shutter flanges. ***See Figure 10.***

Installation is now complete, proceed to Electrical Wiring Section.

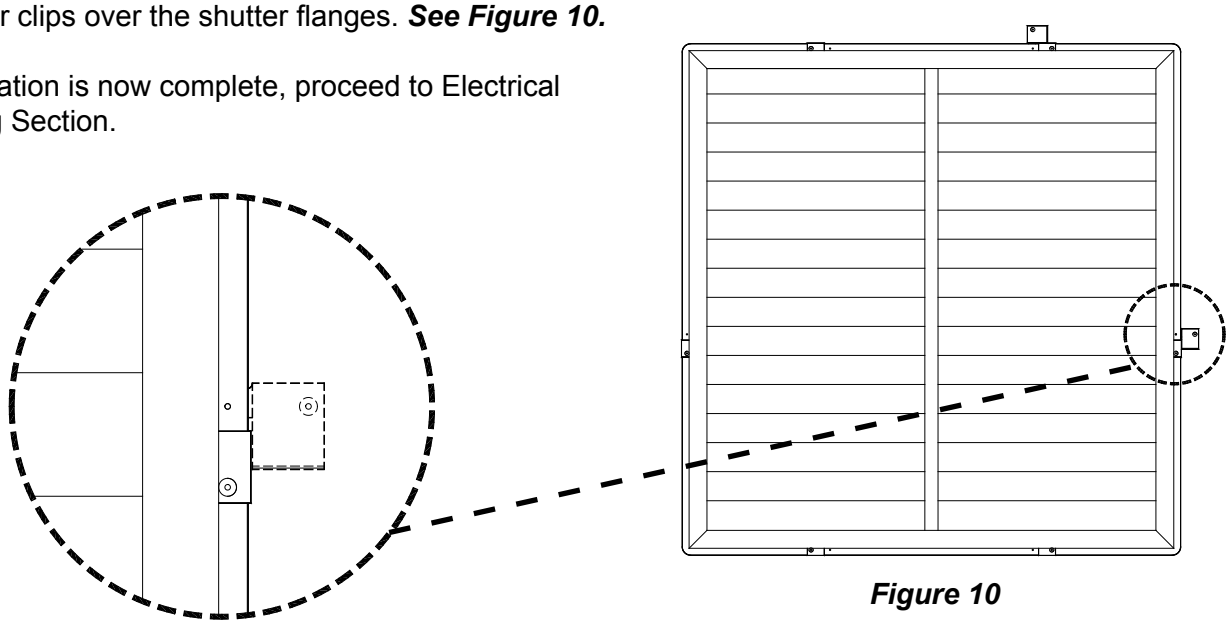


Figure 10

PV style shutter

Step 12

Insert PV shutter into fan by sliding the bottom flange of shutter into bottom shutter clips and pressing shutter inward, ***See Figure 11A.*** Fasten shutter in place by rotating the side and top shutter clips over the shutter flanges, ***See Figure 11B.*** Installation is now complete, proceed to electrical wiring section.

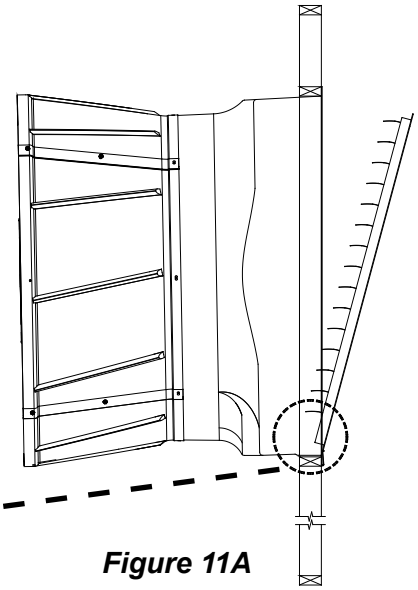
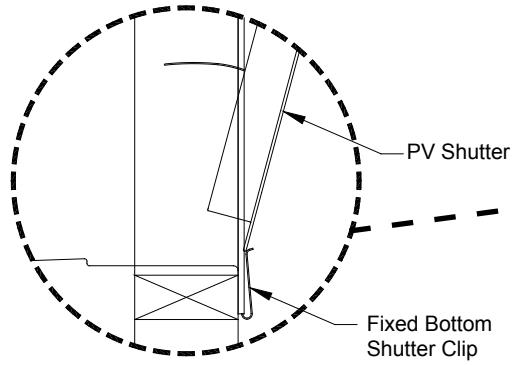


Figure 11A



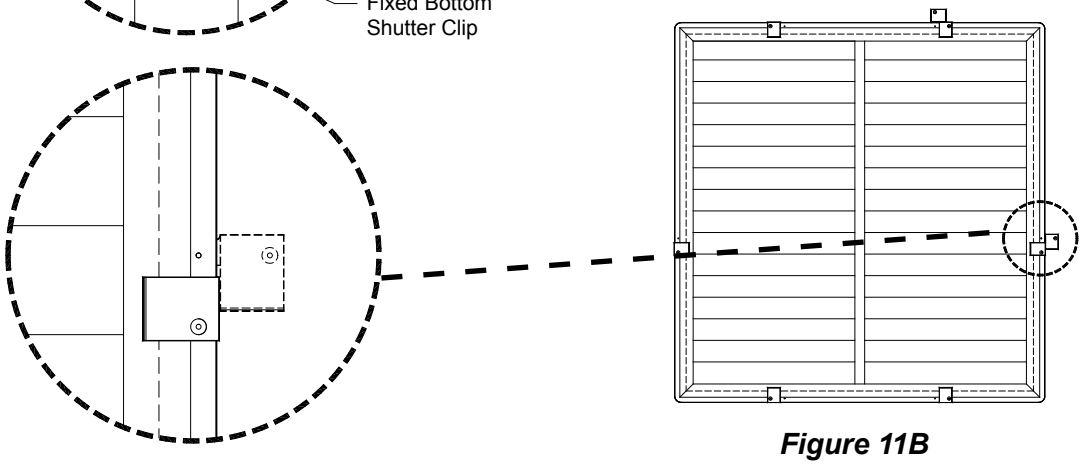


Figure 11B

ELECTRICAL WIRING

Recommended Wire Routing:

As the power cable exits the back of motor form a drip loop and then run power cable down along strut and "Zip" tie the cable to strut to prevent cable from getting tangled in the pulley or belt. ***See Figure 12***. Then run the cable out the drain hole to the circuit breaker or control panel.

(Continued on next page).

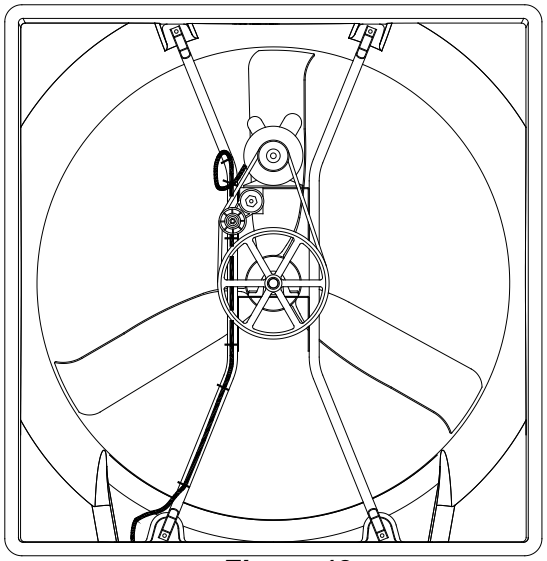


Figure 12

ELECTRICAL WIRING

All wiring should be installed in accordance with National, State, and Local electrical codes. Fans used to ventilate livestock buildings or other rooms where continuous air movement is essential should be connected to individual electrical circuits, with a minimum of two circuits per room. For electrical connection requirements, refer to diagram on motor nameplate and to information enclosed with the Aerotech environmental control to be used.

Single Phase Fans: motor overload protection should be provided for each fan. A Circuit Breaker Switch or slow blow motor type fuses must be used ***See Figure 13A.*** See Aerotech form **QM1400** for proper size.

Three Phase Fans: motor overload protection should be provided for each fan. A three pole motor starter or slow blow motor fuses must be used. ***See Figure 13B.***
If a frequency drive (inverter) is used, confirm that motors are rated for inverter duty at the voltage used. The installation of line reactors is recommended to reduce voltage spikes and harmonic distortion. Supplemental motor overload protection is also recommended.

NOTE: *A safety cut-off switch should be located adjacent to each fan.*

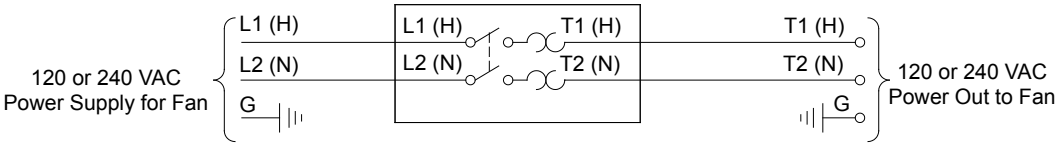


Figure 13A
Single Phase - Motor Overload Protection with Disconnect (SY2000 or Equivalent)

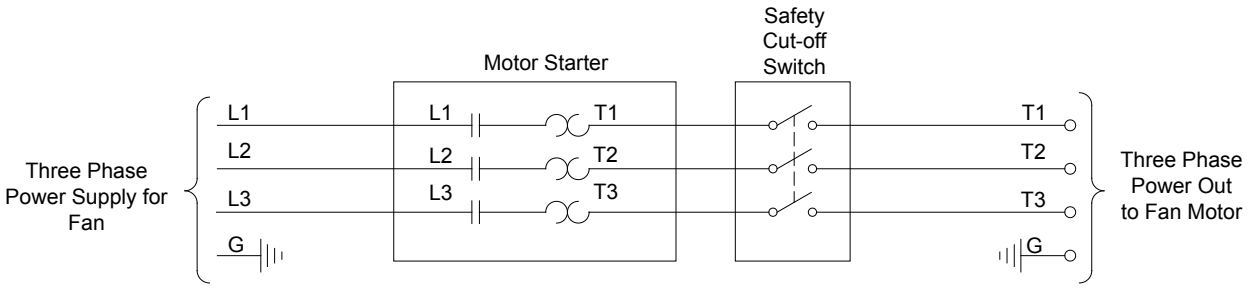


Figure 13B
Three Phase - Motor Overload Protection with Disconnect

NOTE: Information in parenthesis refers to 120 VAC control.

KEY:
L1 = Line 1
L2 = Line 2
L3 = Line 3
H = Hot
N = Neutral
G = Ground

OPERATION

1) **INITIAL START-UP:** With electrical power off, verify that the fan propeller turns freely and that all fasteners are secure. Turn on electrical power and confirm that the fan operates smoothly.

2) **ADJUSTMENTS:** Set the fan control to the temperature shown on your Aerotech ventilations system drawing, or to a value which will provide the desired environmental conditions.

Single Phase Fans: Single phase fans are designed for single speed operation only.

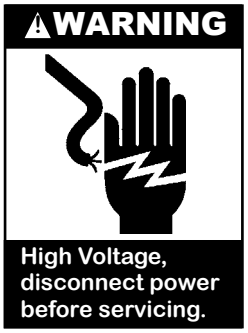
Three Phase Fans:

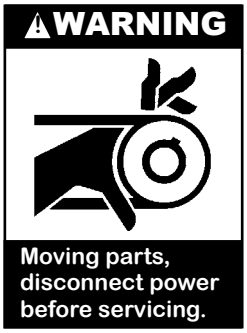
1) The use of a quality frequency drive and the installation of line reactors is recommended to reduce voltage spikes and harmonic distortion.

2) Minimum operating frequency of 30 Hz.

3) Will require three pole contactors with overload protection (by others).

MAINTENANCE





The following inspection and cleaning procedures should be performed monthly:

1) INSPECT PROPELLER: Check that propeller is secure on motor shaft and that there are no signs of damage. The blades are of a self-cleaning design and should not require maintenance.

2) CLEAN regularly for best results:
   • FAN MOTOR: Remove any dust accumulation from motor using a brush or cloth. (DO NOT use a pressure washer). A clean motor will run cooler and last longer.

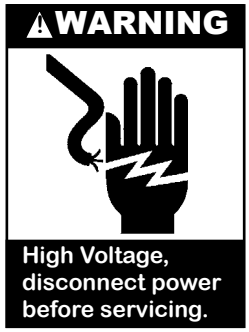
At the same time, verify that the motor is secure in its mount.
   • SHUTTER: Carefully clean dust from shutter blades and frame so that shutter opens and closes freely. A brush or cloth should be used.
   • GUARD: Clean any dust or feathers from fan guards using a brush. Dirty guards can reduce airflow.

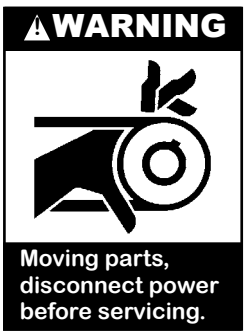
3) CHECK FASTENERS: For safety, all fasteners should be inspected. Tighten any loose connections.

4) INSPECT FAN CONTROL: With power disconnected, inspect all electrical connec-tions. Wiring should be secure and in good condition. Remove any dust build-up from control case and sensor using a soft brush or cloth.

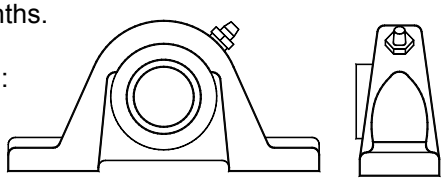
NEVER CLEAN ELECTRICAL EQUIPMENT WITH A PRESSURE WASHER!

Continued on next page

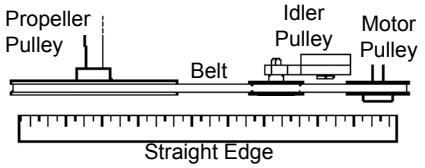




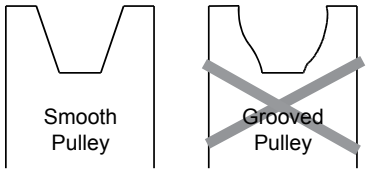
5) GREASE BEARINGS: Grease bearings every 4-6 months. Use no more than 2 shots when greasing fan.
   • A premium non-water based grease is recommended:
   - Shell Alvania #2
   - Exxon Unirex N2
   - Mobil 532
   - Mobil Mobilux #2
   - Texaco Premium RB
   - Texaco Multifak #2



6) CHECK DRIVE ALIGNMENT: Check to make sure the belt is centered on the idler pulley, then use a straight edge to check the alignment of the drive pulleys. If an adjustment is needed, remove the belt, then loosen the set screw in one pulley and move it. Remember to tighten the set screw after making an adjustment. Drive alignment is very important for long belt life and proper operation.



7) CHECKING PULLEYS: Roll the belt off and look at both pulleys. If the pulley has grooves in it or is no longer smooth, it needs replacement. A loose or slipping belt will reduce fan performance up to 60% and cause premature belt failure.



8) BELT TENSIONING: Check condition of belt, if worn, replace belt. If belt is in good condition then make sure the tensioner is in the correct position. Looking from the back of the fan, the correct position of the tensioner is approximately the 7 o'clock position. **See Figure 14A**. To adjust the tensioner, loosen the M10 x 30mm bolt fastening the tensioner to the motor base and place a 27mm wrench onto the hex on the tensioner. Turn the wrench clockwise until the alignment mark is at mark 2 on the tensioner arm. **See Figure 14B**. Hold tensioner at this setting and tighten the M10 x 30mm bolt to 40 ft. lbs. of torque.

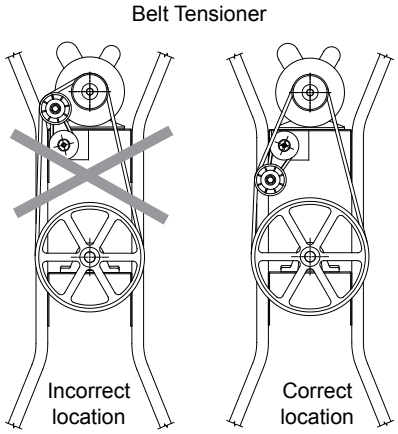


Figure 14A

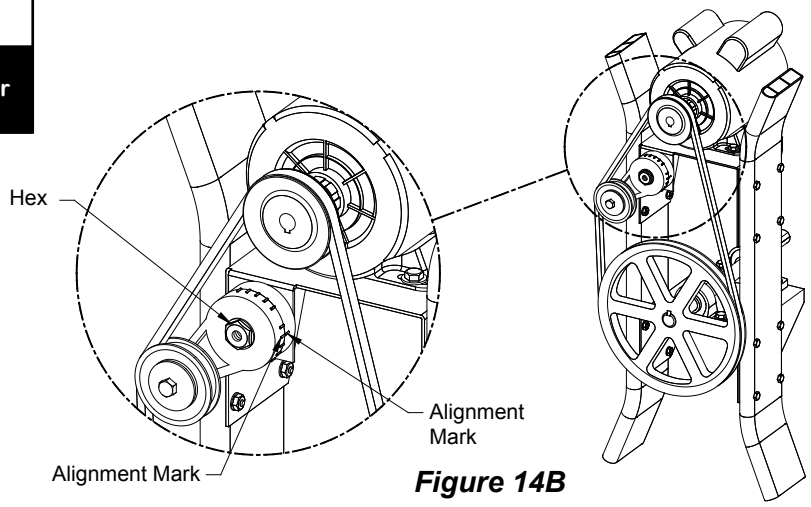
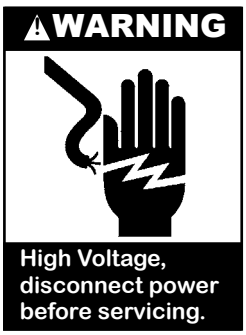


Figure 14B

TROUBLE SHOOTING



SYMPTOM	POSSIBLE CAUSES	CORRECTIVE ACTION
Fan Not Operating	1. Fan control set above room temperature 2. Blown fuse or open circuit breaker 3. Propeller blade contacting fan housing 4. Fan control defective 5. Motor defective	1. Set to a lower temperature 2. Replace fuse or reset breaker 3. Realign motor in fan housing 4. Repair or replace control 5. Repair or replace motor
Fan Operating-Insufficient Airflow	1. Damper door jammed 2. Guard dirty 3. Frequency drive improperly adjusted 4. Incorrect Belt Tension/worn belt	1. Clean damper door & fan housing 2. Clean guard 3. See operation, Step 2 for adjustments guidelines 4. See Maintenance Section, Belt Tensioning
Excessive Noise	1. Propeller blade contacting fan housing 2. Motor bearing or shaft bearing defective 3. Frequency drive improperly adjusted	1. Sand fan housing to remove high spot 2. Repair or replace motor or shaft bearings 3. See operation, Step 2 for adjustments guidelines
Excessive Vibration	1. Motor loose on mount 2. Propeller damaged 3. Motor or propeller shaft bent	1. Tighten fasteners 2. Replace propeller 3. Repair or replace motor or propeller shaft

WINTERIZING FAN

In most climates, it is probable that the ventilation system will never need to operate at a total capacity during the cold winter months. Consequently, it is advisable to "winterize" those fans which will not be used in cold weather to avoid unnecessary heat loss and condensation.

To winterize, turn fan control "off". Install the insulated closure panel over the fan intake. If you don't have an insulated closure panel, a piece of rigid insulation material can be used. **Remember the insulation panel must be removed before warmer weather returns.**

NOTE: At least one single speed fan should be left uncovered and with power available to provide air movement in the event of variable speed control difficulties.

WINTER WEATHER PROTECTION

To prevent cone or fan damage from snow or ice sliding off building roof, weather protection must be provided. A weather shelter may be constructed to cover the entire fan, ***See Figure 15,*** or snow guards may be placed on the roof, ***See Figure 16.***

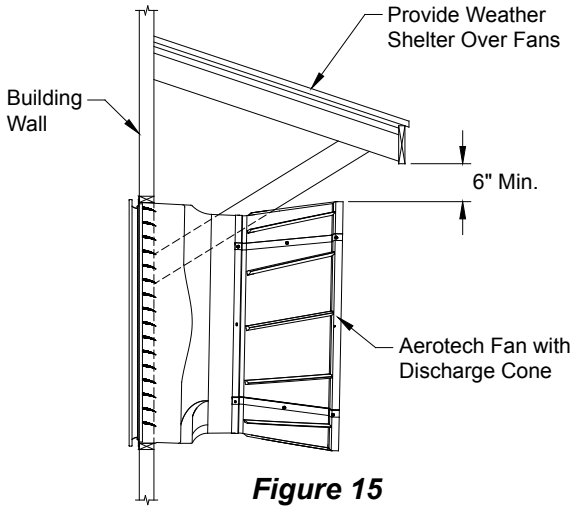


Figure 15

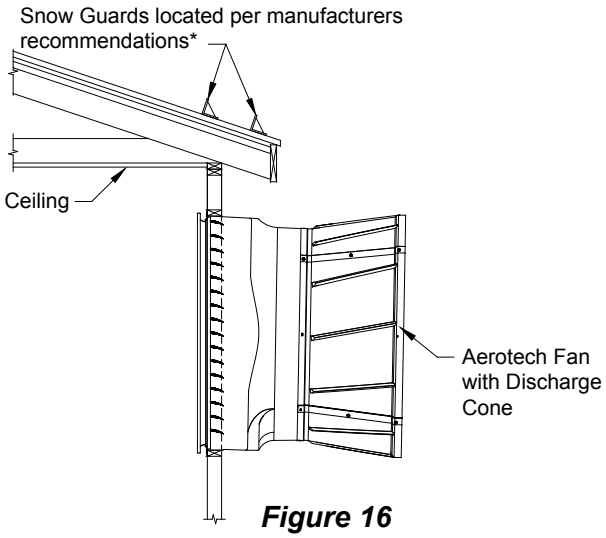


Figure 16

***Snow Guard Suppliers**

Company Name	Phone No.	Fax No.
Snojax, Inc.	(717) 697-1900	(717) 697-2452
Polar Blox	(814) 629-7397	(814) 629-9090
LM Curbs	(800) 284-1412	(903) 759-0879
Real-Tool, Inc.	(703) 338-4544	(703) 338-4654
Vermont Slate & Copper Services, Inc.	(802) 888-8573	(802) 888-8574

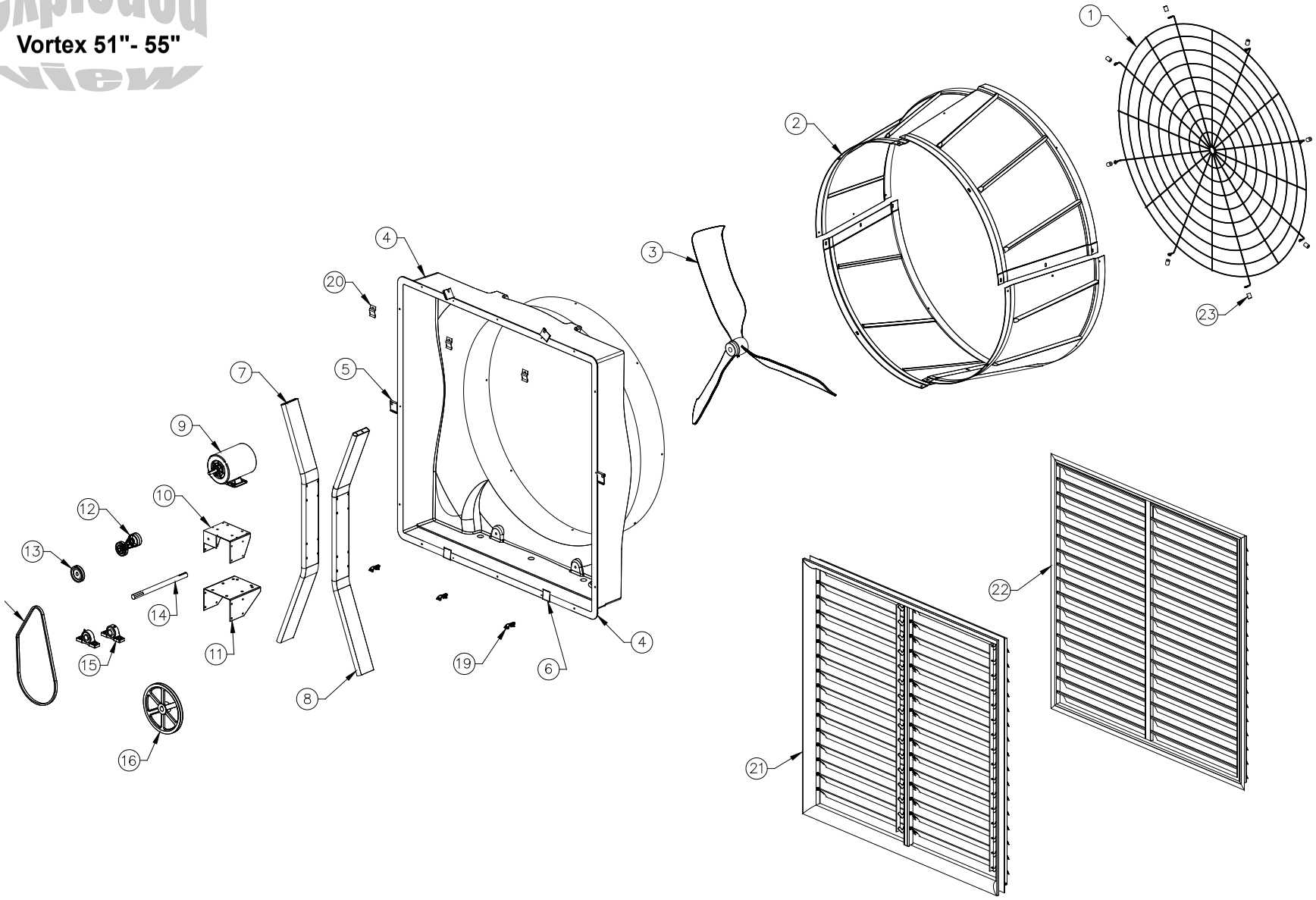
Note: Snow guards are designed to prevent sudden, dangerous snow and ice slides when attached to the building roof according to manufacturers recommendations. The supplier listing above is given as a reference only. Aerotech does not endorse any specific snow guard product and no performance warranty is implied.

⚠ IMPORTANT

Aerotech Ventilation Systems Product and System Warranties DO NOT cover cone or fan damage from external sources.

exploded view

Vortex 51"- 55"



Munters Corporation
4215 Legion Dr. Mason, MI 48854-1036 USA
(517) 676-7070 Fax (517) 676-7078
www.munters.us/aerotech

Item	Catalog No.			Part Name/Description	Quantity
	VX51	VX51 w/51FCE	VX55		
1	FH2651	FH3655	FH3655	Guard Kit, 51"/55" cone, PVC CTD, w/Hardware	1
2	FH3351	FH4551	FH3355	Discharge cone, Fiberglass, (1) Section	4
3	FP1155SS	FP1155SS	FP1155SS	Propeller, BD, 3-blade w/set screws, Aluminum	1
4	FH2351	FH2351	FH2355	Fan Housing w/latches for PR shutter, FG	1
4	FH2352	FH2352	FH2356	Fan housing w/clips for PV Shutter, FG	1
5	FH2119	FH2119	FH2119	Shutter clip, right, for PV shutter, SS	3
6	FH2117	FH2117	FH2117	Shutter clip, left, for PV shutter, SS	3
7	FH2723	FH2723	FH2756	Strut, right, vortex, w/inserts, aluminum	1
8	FH2722	FH2722	FH2755	Strut, left, vortex, w/inserts, aluminum	1
9	Various*	Various*	Various*	Motor, 56 frame	1
10	FH2810	FH2810	FH2810	Bracket, BD motor base, coated-galv.	1
11	FH2725	FH2725	FH2725	Bracket, bearing mount, coated-galv.	1
12	FH2402	FH2402	FH2402	Belt tensioner assembly with 3" idler pulley	1
	FH2406	FH2406	FH2406	3" idler pulley only, with bolt	
	FH2419	FH2419	FH2419	Tensioner arm only, aluminum	
13	Various*	Various*	Various*	Sheave, A-section, 5/8" bore, 3/16" keyseat, CI	1
14	FH2280B	FH2280B	FH2290B	Shaft, 1" dia., steel, w/retaining pin hole	1
15	FH2057	FH2057	FH2057	Bearing, 1" bore x 1.44"CL, CI Holder	2
16	Various*	Various*	Various*	Sheave, A-section, 1" bore, 1/4" keyseat, CI	1
17	Various*	Various*	Various*	V-Belt, A-section, gates predator series	1
18	FH1366	FH1366	FH1366	Drive guard kit, PVC coated	1
19	KX1015	KX1015	KX1015	Latch, draw type, for PR shutter, SS	3
20	FH2131	FH2131	FH2131	Clip, shutter retainer for PR shutter, SS	3
21	PT51	PT51	PT553	Shutter, belled inlet, plastic	1
22	PV51	PV51	PV553	Shutter, all plastic	1
23	-	KX1257	--	Spacer, .320"ID x .75"OD x ¾"L, black	8
-	HP1096	HP1127	HP1094	Hardware pkg., fan/cone install, PT/PV shutter	1

* Contact office for replacement part numbers for your fan configuration.